

Measurement of the differential $W \rightarrow \ell \nu$ cross section at high transverse masses at $\sqrt{s} = 13$ TeV with the ATLAS detector

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The measurement of the differential cross section of the charged-current Drell-Yan (ccDY) process in the decay $W \rightarrow \ell \nu$ is presented, where ℓ is an electron or muon. It is based on pp-collision data taken with the ATLAS detector during the LHC Run-2 at a center-of-mass energy of $\sqrt{s} = 13$ TeV, corresponding to an integrated luminosity of $\mathcal{L} = 140 \text{ fb}^{-1}$.

The cross section is measured differentially as a function of the transverse mass m_T^W as well as double-differentially in m_T^W and the pseudorapidity of the lepton with a focus on the high transverse mass region between 200 GeV and 2000 GeV.

A precise measurement of the ccDY processes at high masses is done for the first time and will allow for constraints on the parton distribution functions of the proton and on effective field theories in the future. An overview of the complete analysis will be given.

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